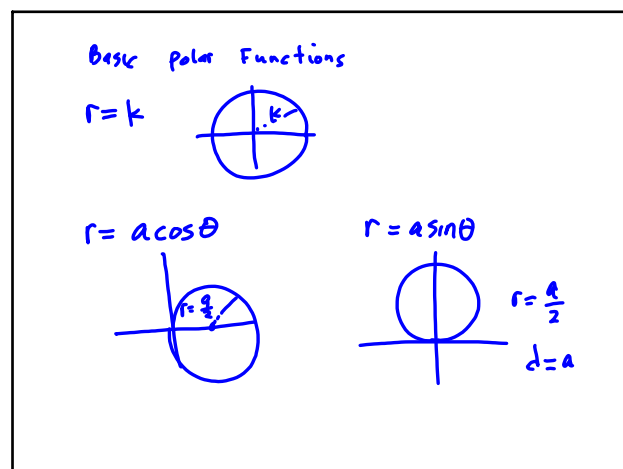
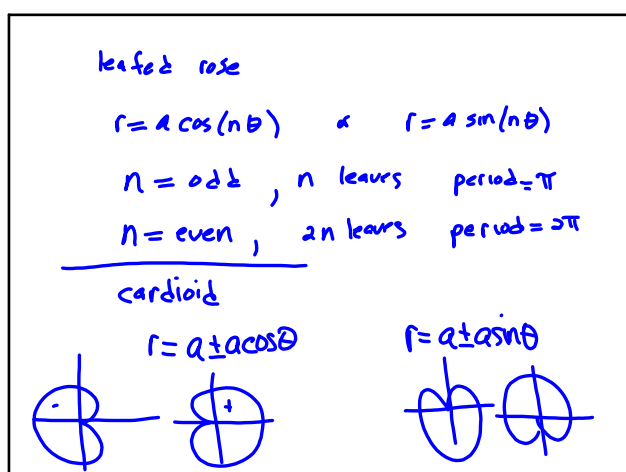


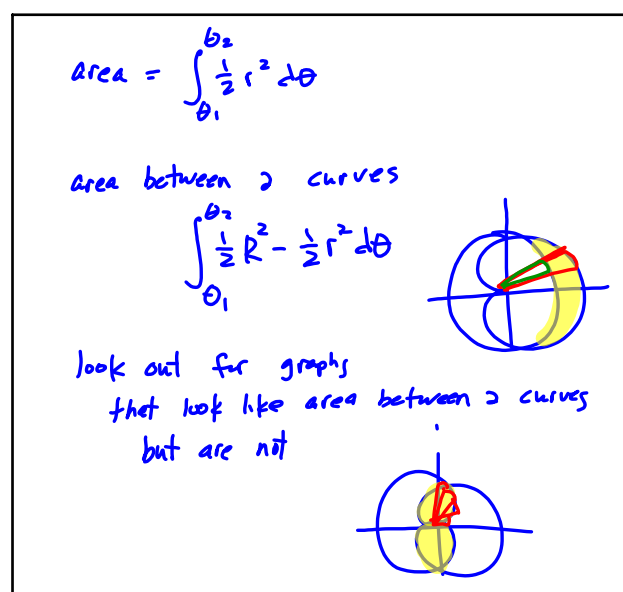
Apr 12-8:56 AM



Apr 12-9:54 AM



Apr 12-9:56 AM



Apr 12-10:00 AM

slope of tangent line to a polar graph

$$\frac{dy}{dx} = \frac{\frac{dy}{d\theta}}{\frac{dx}{d\theta}} = \frac{\frac{1}{d\theta}(r \sin \theta)}{\frac{1}{d\theta}(r \cos \theta)}$$


Ex  $r = 3\theta + \sin \theta \quad 0 \leq \theta \leq 2\pi$

- Find the area in the second quadrant
- A point P on the curve has x coord = 3. Find  $\theta$ . Find y.
- Find  $\frac{dr}{d\theta}$  at  $\theta = \frac{\pi}{4}$ . Explain the meaning of this value

Apr 12-10:20 AM

Apr 12-10:05 AM

a)  $\int_{\frac{\pi}{2}}^{\pi} \frac{1}{2} (3\theta + \sin \theta)^2 d\theta = 47.513$



b)  $3 = r \cos \theta = (3\theta + \sin \theta) \cos \theta$   
 $\theta = 4.931 \quad y = (3\theta + \sin \theta)(\sin \theta) \Big|_{\theta=4.931} = -13.48$

c)  $\frac{dr}{d\theta} = 3 + \cos \theta \Big|_{\theta=\frac{\pi}{4}} = 3 + \frac{\sqrt{2}}{2}$  r is getting further away from origin

Apr 12-10:16 AM

Apr 12-10:22 AM